ENGR H3504: Earthworks Analysis

Module Title:	Earthworks Analysis
Credits:	5
NFQ Level:	7
Module Delivered In	1 programme(s)
Teaching & Learning Strategies:	Lectures Practicals Private study
Module Aim:	The aims of the module are: (1) to produce graduates capable of working with minimal supervision in a modern construction environment; (2) to provide graduates to the workplace capable of participating in all facets of earthworks, on-site, in the laboratory and in the design office, using the industry recognised Standards and Procedures; (3) to give graduates the skills to set up and manage quality control in the construction, quarrying,monitoring and testing industries; (4) to provide graduates with sufficient knowledge and skills to continue to degree level in civil engineering

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Analyse and test soils for earthworks and construction of foundations for structures, roads, dams, embankments (a) Reuse of materials (b) Testing regimes for cut/fill applications (c) Use of BSI 2015, BS 5930 - Ground Investigation (d) Specification for Ground Investigation, 2016, Engineers Ireland
LO2	Have awareness of potential health, safety hazards and risks associated with design of earthworks, dams, roads, foundations including the responsibilities of persons, identification of hazards and risk assessment requirements
LO3	Have understanding of the requirements for testing of unbound materials and the analysis and evaluation for the re-usability of soils and aggregates for civil engineering projects
LO4	identify the appropriate site investigation techniques for differing ground conditions and development types including selection of appropriate laboratory tests depending project requirements
LO5	Have an awareness of the constructions considerations of differing ground conditions and the implications to the construction process including the implications of changes in the properties of soils and why they occur.

Pre-requisite learning		
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*		
6801	ENGR H3504	Earthworks Analysis
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*		
No incompatible modules listed		
Co-requisite Modules		
No Co-requisite modules listed		
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*		
No requirements listed		

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Module Content & Assessment

Indicative Content
Reusability of soils (10 hours lectures, 10 hours practicals) Laboratory testing (a) CBR, MCV, DD vs Moisture Content (b) evaluation of reusability tests (c) Health and Safety
Soil Strength Testing (4 hours lectures, 6 hours practicals) Evaluation of soils strength parameters - drained and undrained (a) Shear box tests (b) Triaxial tests Health and Safety
Ground Investigation (10 hours lectures, 10 hours practicals) (a) Site investigation – advantages and disadvantages of methods (b) Specifying site investigation (c) Trial Pitting, Dynamic Probing, Cable Percussive Boreholes (d) Coreholes (e) Groundwater (f) Health and Safety
In-situ sampling and testing (4 hours lectures, 2 hours practicals) (a) Plate Bearing Tests (b) Shear Vane tests (c) Standard Penetration testing (d) California Bearing ratio (CBR) (e) Health and Safety
Construction Methods (4 hours lectures) (a) Construction of embankments and cuttings (b) Capping and sub-base layers (c) Quality control monitoring (d) Chemical stabilization of soils for reuse as engineering material

Assessment Breakdown	%
Continuous Assessment	5.00%
Project	35.00%
End of Module Formal Examination	60.00%

Continuous Assessment				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	To evaluate progress at mid-term	2,4	5.00	n/a

Project				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Project	No Description	4	35.00	Sem 1 End

No Practical

End of Module Formal Examination				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	No Description	1,2,3,4,5	60.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	Every Second Week	0.50
Practicals	Every Week	1.00
Estimated Learner Hours	Every Week	2.00
Laboratory	Every Second Week	0.50
	Total Hours	5.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_CMHCE_B	Bachelor of Engineering (Honours) in Civil Engineering - Ab Initio	3	Mandatory